



The World Beneath Our Feet: Bugs and the Barataria Preserve

Grades 4 through 7

Courses: Science, English & Language Arts



Lesson Plan Focus:

The world beneath our feet is teeming with life and activity. Invertebrates of every shape and size are busy pollinating plants and crops, disposing of rotting organic materials, and providing food for animals higher up on the food chain. Explore this tiny world bursting with creatures through art, reading, hands-on science, and discovery projects.



A note to teachers:

Thank you for your interest in having your students participate in the “World Beneath Your Feet” program at the Barataria Preserve. All of our programs at the Barataria Preserve are free and all supplies for the on-site activities are provided by the National Park Service.

The rest of the document includes all of the background material and instructions for both you the leader and the park ranger who will conduct your program. You are welcome to read the “on-site activities” if you would like to be familiar with what you will be doing during your time at Barataria, but please don’t give away all of the fun secrets ☺ We recommend that you attempt to complete at least one pre-visit activity and one post-visit activity included in this document, but understand if you are unable to do so.

Finally, we’d love to hear about your pre-visit and post-visit experiences. Feel free to share photos that were taken during the field trip and of any post-visit artwork that your students create. You can contact your lead ranger for information on how to share your work with us.

What to expect during your program at the Barataria Preserve:

What you will see:

- 23,000 acre wetlands preserve located 16 miles from New Orleans on the west bank of the Mississippi River.
- 3 different types of wetlands habitats- of bottomland hardwood forests, swamps, and marshes
- A safe home for hundreds of plant and animal species.

Keep wildlife wild and safe by:

- Staying on the trails at all times
- No food on trails. We will eat lunch in a designated area.

What to bring:

- Everyone should wear closed toed shoes, like hiking boot or sneakers, and clothes that can get dirty
- Insect repellent and sunscreen
- A refillable water bottle.
- Your sense of fun and adventure!



The World Beneath Our Feet: Bugs and the Barataria Preserve

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Common Core Standards

Grades 4 & 5

Writing:

CCSS.ELA.LITERACT.W.4.2/ CCSS.ELA.LITERACT.W.5.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly

CCSS.ELA.LITERACT.W.4.3/ CCSS.ELA.LITERACT.W.5.3

Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences

CCSS.ELA-LITERACY.W.4.4/ CCSS.ELA-LITERACY.W.5.4

Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.4.4/ CCSS.ELA-LITERACY.SL.5.4

Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

CCSS.ELA-LITERACY.SL.4.5/CCSS.ELA-LITERACY.SL.5.5

Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Reading: Information Texts:

CCSS/ELA-LITERACY.R1.4.1

Refer to details and examples in a text when explain what the text says explicitly and when drawings references from the text

CCSS/ELA-LITERACY.R1.4.2/ CCSS/ELA-LITERACY.R1.5.2

Determine the main idea of a text and explain how it is supported by key details; summarize the text.



Common Core Standards

Grades 6 & 7

Writing:

CCSS.ELA-LITERACY.W.6.2/ CCSS.ELA-LITERACY.W.7.2

Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.6.4/ CCSS.ELA-LITERACY.W.7.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking and Listening:

CCSS.ELA-LITERACY.SL.6.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.2

Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.6.4

Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.6.5

Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

CCSS.ELA-LITERACY.SL.6.6

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 for specific expectations.)



Reading: Informational Texts:

CCSS.ELA-LITERACY.RI.6.1

Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-LITERACY.RI.6.2

Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

CCSS.ELA-LITERACY.RI.6.4/ CCSS.ELA-LITERACY.RI.7.4

Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

CCSS.ELA-LITERACY.RI.6.7

Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

CCSS.ELA-LITERACY.RI.7.2

Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

CCSS.ELA-LITERACY.RI.7.5

Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.

Science & Technical Subjects:

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.



Vocabulary List

Abdomen: one of the three main body segments of an insect and one of the two main body segments of an arachnid. The organism's organs, like the heart, reproductive organs, and digestive organs, are located in this body segment.

Adaptation: A trait or characteristic of an organism that helps it to survive in its habitat.

Arachnid: The class of arthropods that have 4 pairs of legs and two body segments. Spiders, ticks, scorpions, and mites belong to this class.

Arthropod: The phylum of animals that are characterized as invertebrates and have joined appendages. Arachnids, insects, crustaceans, centipedes, and millipedes belong to this group.

Beneficial insect or arachnids: Insects that help humans in some way, such as bees pollinating food crops or spiders that eat pest animals like cockroaches or mosquitoes.

Biological Diversity/ Biodiversity: All of the different types species living within an ecosystem. This includes all plants, animals, fungi, etc.

Camouflage: The ability of an animal to blend into its surroundings making it difficult to be seen.

Cephalothorax: One of the two body segments of an arachnid. The cephalothorax is the fused head and thorax. The legs, eyes, and mouth parts are located on this segment.

Colony: A group of the same kind of insects that live together and cooperate to defend the colony, raise young, and gather food.

Complete metamorphosis: Insects that go through four stages of metamorphosis- egg, nymph, pupa, and adult.

Decomposer: An organism that breaks down dead or decaying material and helps carry out the process of decomposition.

Habitat: The natural home for a plant or animal.

Insect: The class of arthropods that have 3 body segments, 2 antennae and 3 pairs of legs. Some insects have wings, but not all. This group includes butterflies, beetles, grasshoppers, and dragonflies.

Incomplete metamorphosis: Insects that only go through three stages of metamorphosis- egg, nymph, and adult.



Invertebrate: An organism with no back bone.

Macro-Invertebrate: A small organism with no back bone that can be seen with the naked eye.

Poison: A substance that can cause an animal to become sick, or even die, if it is swallowed or if the animal touches it. Poison ivy contains an oil that causes an itchy, burning rash on a human when he or she touches it. Likewise, an animal that eat a Poison Dart Frog from the Amazon rain forest may become sick and die.

Pollination: The act of an insect or other pollinator transferring pollen to the reproductive organs of a plant and enabling fertilization.

Pollinator: An insect or other organism that pollinates a plant. Bees, butterflies, beetles, some ants, and some wasps are pollinators.

Solitary: An insect or arachnid that does not live in a hive, but rather lives and hunts on its own.

Terrestrial: An organism that lives on land.

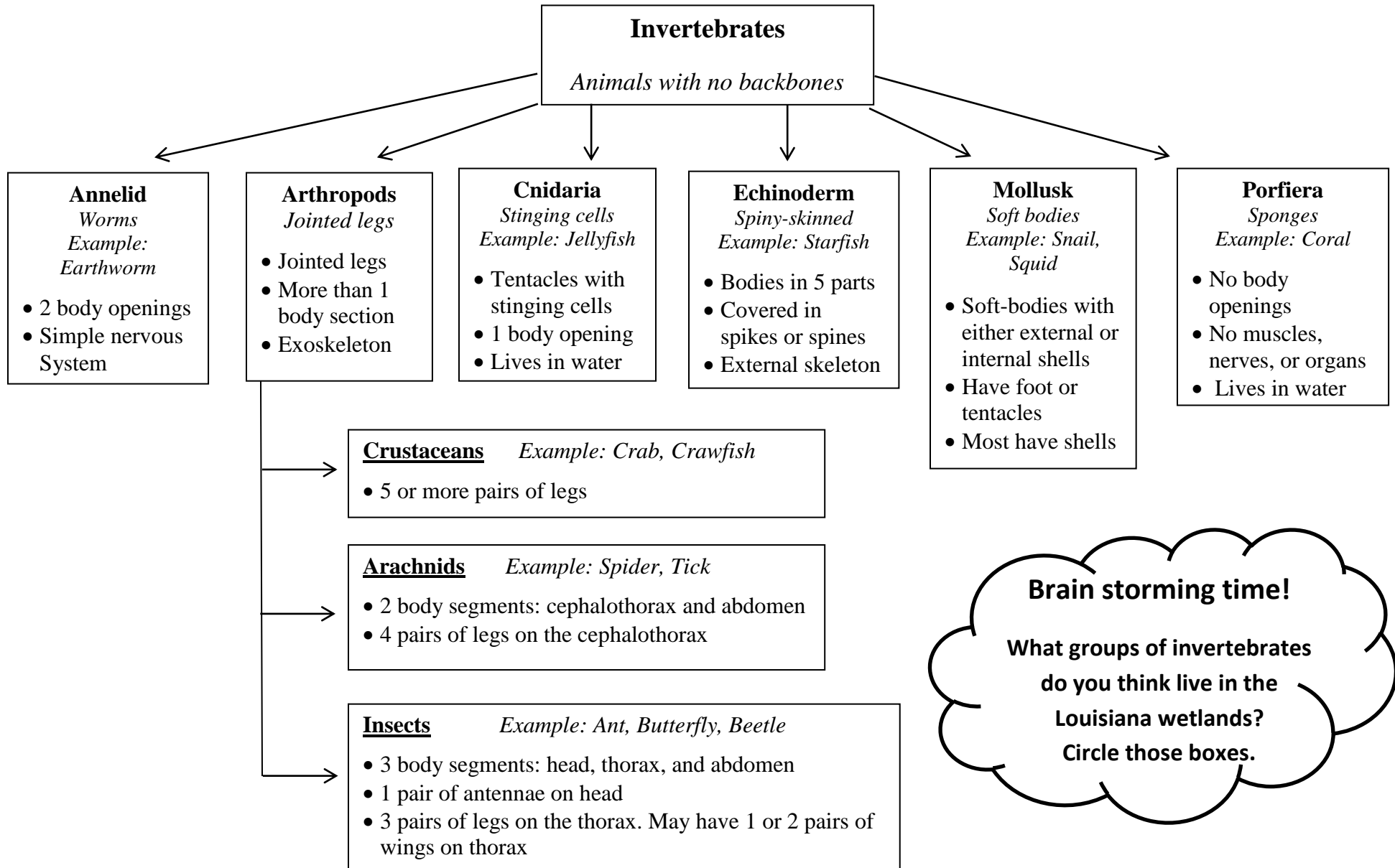
Thorax: The middle segment of an insect. The legs and, if present, the wings are attached to this segment.

Venom: A substance that is injected into an animal via a stinger or fangs and causes the animal to become sick, or even die. Spiders use venom from their fangs to paralyze their prey.

Vertebrate: An organism with a backbone.



Spinney, Squishy, Crunchy: Animals with No Backbones
Pre-Visit Activity Grades 4 through 7 Subject: Science



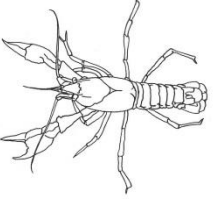




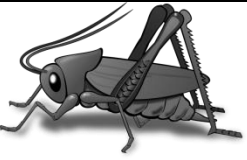

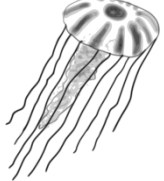



Name: _____

Date: _____

Spinney, Squishy, Crunchy: Animals with No Backbones.

Directions: Look at the pictures below and use the Invertebrate chart to determine what group each organism belongs. Write down your answer and one reason why you think so.



Spinney, Squishy, Crunchy: Animals with No Backbones

Teacher Answer Sheet

<p>Crawfish Group (phylum): Arthropod Group (class): Crustaceans</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. 5 pairs of jointed legs 2. exoskeleton 	<p>Spider Group (phylum): Arthropod Group (class): Arachnid</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. 8 legs 2. 2 body segments/parts 	<p>Earth Worm Group (phylum): Annelid</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. No legs 2. It's a worm
<p>Starfish Group (phylum): Echinoderm</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. Spinney skin 2. 5 limbs/arms 	<p>Snail Group (phylum): Mollusk</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. Has a shell 2. Has a squishy body 	<p>Grasshopper Group (phylum): Arthropod Group (class): Insect</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. 6 legs 2. 3 body segments/parts
<p>Coral Group (phylum): Porifera</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. No body openings 2. Lives in the water 	<p>Jelly Fish Group (phylum): Cnidaria</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. Has stinging tentacles 2. Soft bodies 3. Lives in the water 	<p>Crab Group (phylum): Arthropod Group (class): Crustaceans</p> <p>How do you know?</p> <ol style="list-style-type: none"> 1. 5 pairs of jointed legs 2. exoskeleton



School Yard Scavenger Hunt

Pre-Visit Activity

Grades 4 through 7

Subject: Science

Look up, look down, look all around!

Time: 30 minutes

Activity Instructions:

1. Divide class into groups of 2 or 3
2. Pass out one scavenger hunt card to each group.
3. Review safety rules for exploring the school yard. Students should not pick up any bug and should avoid stinging insects.
4. Check to make sure no student is allergic to bees, wasps, or ants. If you do have a student that is allergic, they may either sit out this activity or work with the teacher to complete the hunt.
5. Allow the students 30 minutes to explore appropriate green spaces in your school yard. Arthropods can be found in the soil, under leaves, on trees and bushes, flying overhead, etc.

After-Activity Questions

Teacher Instructions:

Either ask aloud or have the students write the following questions into their notebooks. Give students about 10-15 minutes to write their answers or provide time for them to discuss their answers aloud. Answers will vary with all of these questions.

1. Where did you find the most insects? Describe what those areas looked like.
2. Where did you find the most arachnids? Describe what those areas looked like.
3. If the insects and spiders were found in different areas, why do you think so?
4. Was it easy or hard to find insects and spiders around your school? What was the hardest bug to find? Why do you think?
5. If you did this activity again, what tools might you use to make it easier to find bugs? *(answers may include magnifying glasses, nets, shovels to dig into the dirt, sticks or tweezers to poke and pick at logs).*

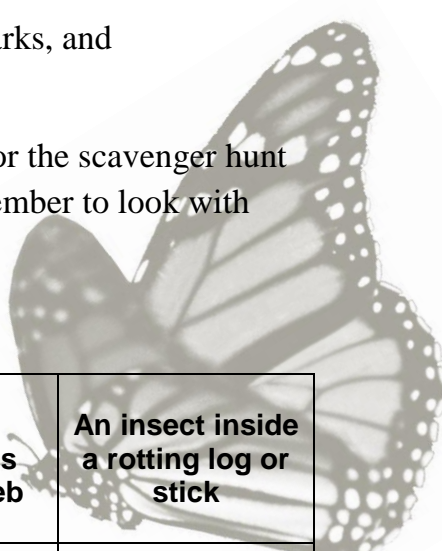


Look up, look down, look all around!

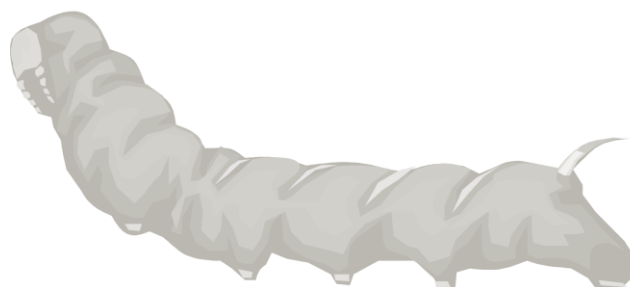
School Yard Scavenger Hunt

Bugs are everywhere- our school yards, backyards, neighborhood parks, and playgrounds.

With a partner, explore the green spaces at your school and search for the scavenger hunt items. **Each bug that you find can only be used in one box.** Remember to look with your eyes and leave all bugs where you find them.



An earth worm in the dirt	An insect with 2 pairs of wings	A spider not in a web	A spider wrapping its prey in a web	An insect inside a rotting log or stick
A pollinating insect	An ant hill (Don't disturb the hill.)	Dragonfly on a plant	An arachnid other than a spider	An insect with eyespots on its wings or back
An insect that goes through metamorphosis	A camouflaged spider	An insect with chewing mouth parts	Pill bugs, or roly-polys, under a log	A camouflaged insect
A spider in a web	An insect munching on some plants	Ants marching in a line	An insect with 1 pair of wings	An insect that could live in the water
An insect with no wings	A white larvae in the dirt or rotting log	An insect longer than 3 inches	A jumping spider	A caterpillar on a leaf or stick





Field Trip Activity 1: Terrestrial Insect Sampling

Grades 4 through 7

Course: Science

Introduction:

Look up! Look down! Look all around! Invertebrates can be found all around you. Some fly in the air, some crawl on the ground, and some burrow under the soil. Because invertebrates are small and can hide almost anywhere, scientists use many different methods to collect invertebrates.

Focus:

Students will join a park ranger and learn how to safely collect insects for observation from their natural habitat.

Learning Goals:

Upon completing the ranger-guided activity, students will:

1. Know how to safely collect macro invertebrates.
2. Know which collection method to choose for a particular type invertebrate.
3. Be able to describe where and why certain types of invertebrates might be found in a particular habitat.

Materials: Provided by the Park Ranger

- Aerial and sweep nets
- Sorting trays
- Collecting jars and bug boxes
- Hand lenses

Activity Instructions:

After a safety talk and introduction to the Barataria Preserve, the Ranger will lead the students in an invertebrate collecting activity. Students will first spend 5 minutes recording their observations about their collection site and draw a picture of what the habitat looks like. Then, students will be provided with collection materials: nets, collection containers, sorting trays, and hand lenses- and be given tutorials on how to properly and safely collect organisms.

Please note that full participation is mandatory for all teachers and chaperons during this activity. Teachers- please inform your chaperons of the nature of the field trip. All participants should be prepared to go off-trail in the woods where they will encounter bugs and other wildlife.





Collection technique descriptions:

- ***Aerial nets:*** Aerial nets are thin, light-colored nets used to catch delicate flying insects like butterflies, dragonflies, and moths. Students will gently wave nets over the tops of flowers and other plants to capture flying insects.
- ***Sweep nets:*** Sweep nets are larger nets with heavier fabric than aerial nets. Students will sweep these nets back and forth through bushes, trees, and other vegetation to scoop up any invertebrates.
- ***Log Busting:*** Students will choose a small, decomposing log no larger than their forearm to break apart on a sorting tray.
- ***Leaf litter sorting:*** Students will carefully gather a pile of leaves from the forest floor onto a tray. They will use forceps and magnifying glasses to sort through the leaves and pick out any invertebrate and place it in a collection jar.

After about 30 minutes or so of collecting, the students will return to the Education Center to begin identifying and recording their samples.

All education programs at the Barataria Preserve practice capture-and-release techniques. After the students have spent time identifying their organisms, they will release their samples back into the woods. No one will be permitted to take samples home.



Field Trip Activity 2: Identifying and Recording Collection Samples

Grades 4 through 7

Course: Science

Focus:

Continuing from the hands-on bug hunt, students will work in small groups to identify the organisms they have collected. Students will learn to use field guides and identification charts to identify the invertebrates collected from the previous activity. Working in groups, the students will then record their data on provided charts and work with the ranger to analyze and discuss the data.

Learning Objectives and Goals:

During this activity, student will:

1. Use field guides or identification charts to identify unknown organisms to the family or species level.
2. Record, analyze, and make inferences about the data collected from the collection activity.

Upon completing this activity, student will be able to:

1. Identify down to the family level at least 3 of the organisms they collected during the bug hunt.
2. Describe the differences between insects, arachnids, and other invertebrate species.
3. Organize their collection according to taxonomic groupings.

Materials- Provided by the Park Ranger

- Grade-appropriate field guides and identification charts
- Pencils
- Data chart

Activity Instructions:

- After collecting their invertebrates, the students will join the park ranger in the Education Center classroom to begin identifying their organisms.
- Students will use provided field guides and identification resources to identify the organisms they have captured.
- The park ranger will provide the students with data charts and pencils. As the students identify their organisms, they will record the names and number of specimens on the data chart.



- Once all of the students are finished identifying their organisms, the ranger will work with the group to create a larger class chart to total all specimens. The ranger will lead a discussion about the findings.



Post-visit Activity: What's Bugging You?

Grades 4 through 7

Course: Science

Focus:

Students will combine the information they've learned about invertebrates during the pre-visit activities with their experiences at the Barataria Preserve to create a poster presentation about 1) the role invertebrates play in the wetlands and 2) how insects or arachnids benefit their own lives.

Learning Objectives and Goals:

During this activity, students:

1. Will conduct research using books and/or the internet about a chosen topic.
2. Will work independently or in small teams to produce a poster presentation based on their research topic.
3. Will reflect on their feelings and ideas about insects and arachnids, focusing on the relationship between the organisms, their environment, and the students' own lives.

After completing this activity, student will:

1. Be able to identify and discuss the roles invertebrates play in wetlands ecosystems.
2. Be able to identify and discuss the roles invertebrates, both beneficial and harmful, play in human lives.

Materials:

- Notebook and pen
- Poster paper or drawing paper
- Pencils
- Crayons, markers, color pencils
- Research materials



Activity Instructions:

- Students will journal or free write for 10 minutes about their experiences and feelings during their participation of this unit. Teachers may assign or encourage students to copy and answer as many of the following questions as appropriate into their notebooks:
 - How did you feel about bugs before you participated in the field trip?
 - How do you feel about bugs now?
 - What did you learn at the Barataria Preserve about invertebrates?
 - How are invertebrates important to the wetlands ecosystem?



- How do invertebrates benefit our own life every day?
- What can you do to help others not be so afraid of bugs?
- What can you do to help beneficial bugs?
- After journaling, students should be given the opportunity to share some of their feelings and writings with the class.
- Next, allow students to choose an insect, arachnid, or other invertebrate from the provided list. Encourage students to choose different organisms. Students may choose another invertebrate that is not on the list as long as it lives in the wetlands and is not a crustacean i.e. crawfish, shrimp, or crab.
- Students will research their organism using books or using the internet (middle school students only) and will create a poster or large drawing.
- The poster should include:
 - The common name (all grades) and scientific name (fifth through seventh grade) of the chosen organism.
 - The order and family label of organisms (fifth through seventh grade only)
 - Drawings and labels of what the organism eats
 - Drawings and labels of the organism's habitat
 - Interesting facts about the organism
 - How the organism benefits and/or harms humans
- Upon completion, students will present their posters to the class.

Suggested list of invertebrates:

Insects	Bumble bee	Long-Jawed Orbweaver
Giant Swallowtail Butterfly	Carpenter Bee	Spiny Crab-like Orbweaver spider
Luna Moth	Blue Dasher dragonfly	Thin-legged Wolf spiders
Io Moth	Carolina Mantid	Six-spotted Fishing spider
Eyed Click Beetle	Crane Fly	Common House Spider
Patient Leather Beetle	Formosan Subterranean Termite	Spotted Orbweaver
Asian Tiger Mosquito	True Katydid	Daddy Longlegs
Eastern Pondhawk Dragonfly	Salvinia weevil	Black-legged Tick
Ebony Jewelwing Damselfly	Oak Hairstreak Butterfly	Lone Star Tick
Love Bug	Blue Mud Dauber	Chigger
Carpenter Ant	Red paper wasp	Other invertebrates
Deerfly	Arachnids	Earth worm
Black Horse Fly	Golden Silk Orbweaver spider	Garden Centipede
Giant Water Bug	Garden Orbweaver Spider	Soil Centipede
Eastern Lubber Grasshopper	Harvestmen spider	Spirobold millipede
Tent Moth	Brown Recluse spider	Land snails
Isabella Tiger Moth	Orchard Orbweaver spider	Land slugs



Post-visit Activity: Biodiversity Reflection Writing

Grades 4 through 7

Course: English & Language Arts

Introduction:

Author, scientist, and environmentalist E.O. Wilson has spent his professional career studying ecology and the wriggling critters beneath our feet. In his book *Letters to a Young Scientist*, he challenges all young people to consider the world around them from a different perspective. In this activity, student will have the opportunity to reflect on their visit to the Barataria Preserve.

Focus:

Students will read a short excerpt from *Letters to a Young Scientist* and use it as a journaling prompt.

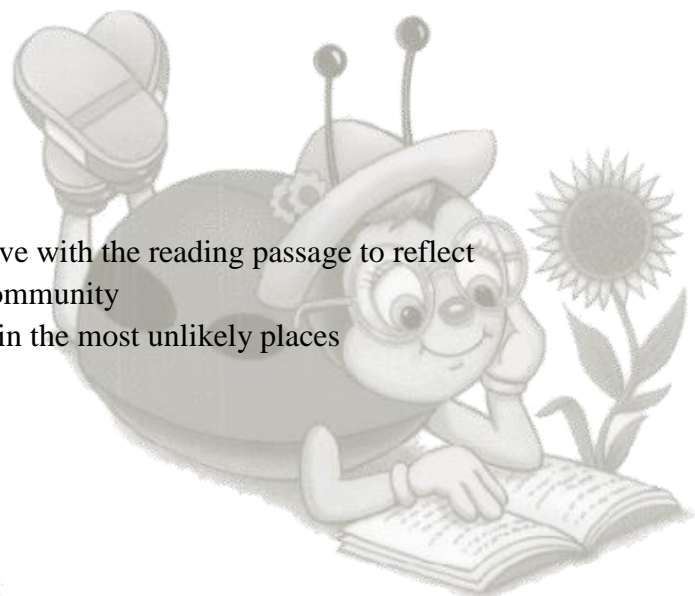
Learning Objectives and Goals:

During this activity, students:

1. Practice their reading skills
2. Link their experiences at the Barataria Preserve with the reading passage to reflect thoughtfully about the biodiversity in their community
3. Understand that life is all around them, even in the most unlikely places

Materials, per student:

- Student note book
- Writing instrument
- Reading prompt and question sheet



Activity Instructions:

1. Instruct students to pull out their notebooks and a pencil. Pass out a reading prompt sheet to each student.
2. Allow 10 minutes for students to read the passage silently to themselves.
3. **Optional:** Provide time for students to discuss passage together- either in small groups or as a class. Focus on words that may be unfamiliar; themes that were present both in the passage and during the field trip to the Barataria Preserve; or parts of the passage that were confusing.
4. Allow 30 minutes for students to write their journal entry. **Optional:** provide time for students to discuss their writing either in small groups or as a class.



Just a Rotten Stump or a Mini World? What do You Think?

Directions: Read the passage below and use the questions to write a journal entry about your visit to the Barataria Preserve and the biodiversity all around you.¹

“Very few places remain on Earth that are *not* seething with species of plants, animals, or microorganisms. At this time, for all intents and purposes the biological diversity seems almost infinite; and each living species in turn offers scientists boundless opportunities for important original research.

“Consider a rotting tree stump in a forest. You and I casually walking past it on a trail would not give it more than a passing glance. But wait a moment. Walk around the stump slowly, look at it closely- as a fellow scientist. Before you, in miniature, is the equivalent of an unexplored planet. [...]

“What life exists in the stump microplanet?”

Underline words you do not know.

Use this space to write down any questions you may have about the reading.



¹ E.O. Wilson, *Letters to a Young Scientist* (New York: Liveright Publishing Corporation, 2013), 111-112. Excerpt is included in this lesson plan with permission from publisher, 20 May 2015.



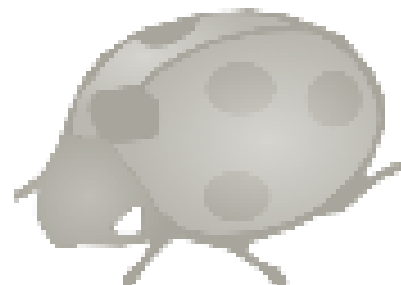
Just a Rotten Stump or a Mini World? What do YOU Think?

1. Based on your time at the Barataria Preserve and from the reading by E.O. Wilson, what do you think **biological diversity** means?



2. Close your eyes and imagine that rotting stump E.O. Wilson is talking about. What kind of animals might you find in the stump? What are they doing? Why do you think a rotten stump is such a great place to find so many critters?

3. **Write a 2-paragraph journal entry in your notebook about your time searching for bugs at Barataria.** Does this reading by E.O. Wilson remind you of your field trip? Where at the Barataria Preserve did you find the most animals?





Post-Visit Activity: Arthropod Art

Grades 4 through 7 Subject: English and Art

Introduction:

Butterflies, beetles, crawfish, worms, and spiders can produce passionate responses from all of us. We can marvel at the beauty and color of a dragonfly but squeal when a bumble bee gets to near. In this activity, students will take a step back from how strange or alien invertebrates can seem to us and appreciate their beauty. Even the most fierce looking crawfish can inspire art.

Focus:

Students will choose an arthropod- insect, arachnid, or crustacean- and create an art project inspired by their chosen animal.

Learning Goals and Objects:

Goals: *At the end of this activity, students will have:*

- Created an anatomically correct arthropod based off of invertebrates chart
- Incorporate science terms into detailed descriptions of the student's creation
- Link concepts of "habitat," "niche," and "ecosystem webs" with the student's creation

Objectives: *During this activity, students:*

- Will use art mediums to help express their understanding of invertebrate anatomy and their place in ecosystems

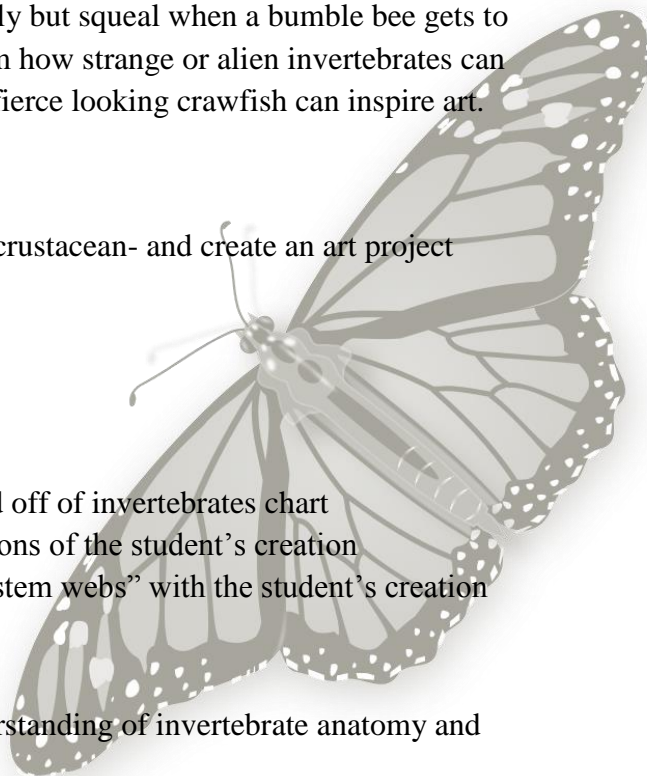
Materials

- Student notebooks
- Writing utensils
- Drawing paper or poster paper
- Art medium of choice: color pencils, crayons, markers, paints
- Haiku resources, Appendix II

Activity Instructions:

This activity can be completed over multiple class sessions.

1. After completing the [Invertebrate activity title name], students will spend 5 minutes brainstorming ideas for their own arthropod creation. Suggest that the students spend the brain storming session thinking about what type of arthropod they will create (insect, arachnid, crustacean), how big it may be, what colors it will be, where it will live, and what it will eat.





2. After the brainstorming session, the students will spend 30-45 minutes sketching their creation and writing a brief description of the arthropod, including its habitat, its food preferences, and what it does in its habitat (i.e. hunts other insects, pollinates plants, decomposes rotting logs, etc).
3. In class, students will use their sketches and written descriptions to create a poster or painting of their arthropod in its habitat. Habitats should be appropriate to the organism. For example, if a student chooses to make a painting about a blue crab, the crab should be placed in an aquatic habitat, not around trees.
4. **Optional:** Review haiku poetry with students and assign them to draft a haiku about their arthropod. The poem should be included somewhere on the painting or poster.

Helpful hints:

- If students are having trouble remembering which animals are arthropods, have them review the “Spinney, Squishy, Crunchy: Animals with No Backbones” worksheet.
- Encourage students to choose arthropods that are native to southern Louisiana. Some suggestions for native insects and arachnids can be found in the “What’s Bugging You” post-field trip activity.



Appendix I:

Field Trip Materials-

To be used by Park Ranger



Name: _____

Directions: With your partner, use the space below to record your **observations** about your surroundings. Then, draw a picture on the back of this paper of the habitat around you.

What do you see? Do you see any animals? What do the plants look like? Do you see any water, sticks, or other places where bugs can hide?

What do you hear? Describe the sounds and guess what you think they are.

What do you smell? Describe the smells and guess what you think they are.

How do you feel? Excited? Nervous? Scared? Why do you feel this way?



Use the space below to draw a picture of your surroundings.



Name: _____

Directions: With your partner, use field guides to determine what kind of macro-invertebrates you caught during the bug hunt. Record your findings on the chart below and answer the questions when you are finished.

Order	Family	Number Caught- Use tally marks	Total Number
Coleoptera	Beetles		
Dermaptera	Earwigs		
Diptera	Flies, Love Bugs		
Hemiptera	True Bugs		
Homoptera	Cicadas		
Hymenoptera	Bees, wasps, ants		
Lepidoptera	Butterflies, moths		
Odonata	Dragonflies, damselflies		
Orthoptera	Grasshoppers, crickets, katydids		
Phasmida	Walking sticks		
Araneae	Spiders		
Opiliones	Daddy-long-legs		
Spriobolida	Millipedes		
Opisthopora	Earthworms		
Stylommatophora	Snails and Slugs		
Isopoda	Pill bugs		

How many total *insects* did you catch? _____

How many total *arachnids* did you catch? _____

How many other invertebrates did you catch? _____

Which capture method got the most invertebrates? Circle one:

Aerial nets

Sweep Net

Log Busting

Leaf-litter sorting



Appendix II:

Arthropod Artwork-

Insect Haiku Resources



Haiku resource page.

History of the haiku

Information about the history of haikus can be found at the following websites:

- Poetry through the Ages:
 - http://www.webexhibits.org/poetry/explore_famous_haiku_background.html
- Encyclopedia Britannica
 - <http://www.britannica.com/art/haiku>
- With Words
 - <http://www.withwords.org.uk/history.html>

Structure of haiku

English haikus are written in 3 lines with 5 syllables in the first line, 7 syllables in the second line, and 5 syllables in the third line. The whole haiku should be a complete thought that can be told in one poem. Encourage your students to write haikus that describe their arthropod art

Examples:

Firefly

A giant firefly-
That way, this way, that way, this-
And it goes passing by

-by Kobayashi Issa, 1762-1826

Chrysalis' Slumber

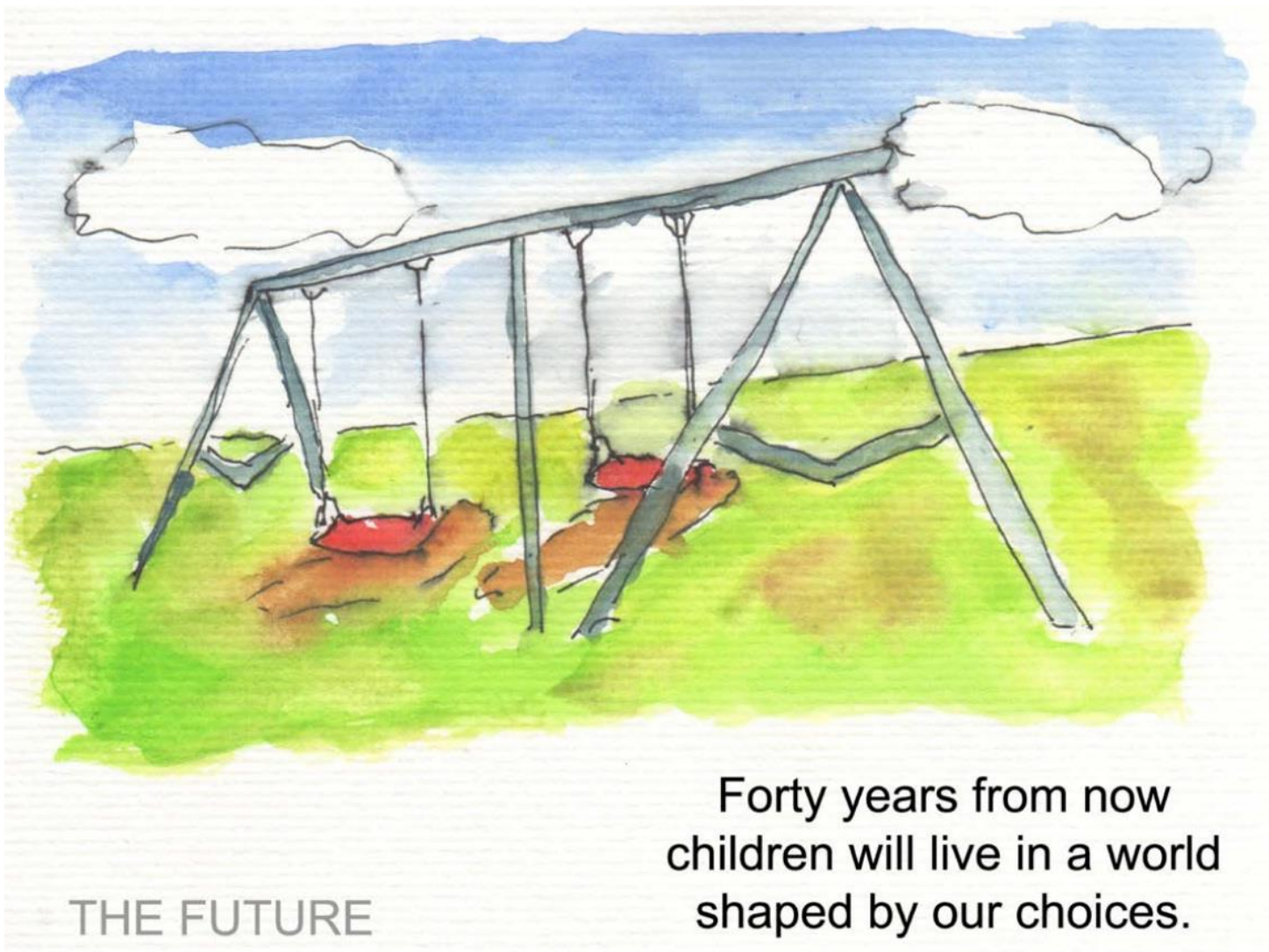
The winter is cold.
Inside my cocoon I sleep
Waiting for the spring.

-by Brookfield Zoo Bug Club, 2007

Drill Team

The last cicadas
Shrill their dry trill through treetops
Rattled by the breeze.

-A Haiku Each Day, 2012



Haiku and painting sample

Share the above image with your students as an example of how to combine their painting and poem into a single piece of art.

Source: Gregory C. Johnson, "Climate Change Science 2013: Haiku"

https://www.wmo.int/youth/sites/default/files/field/media/library/full_ipcc_haiku_slides_opt.pdf

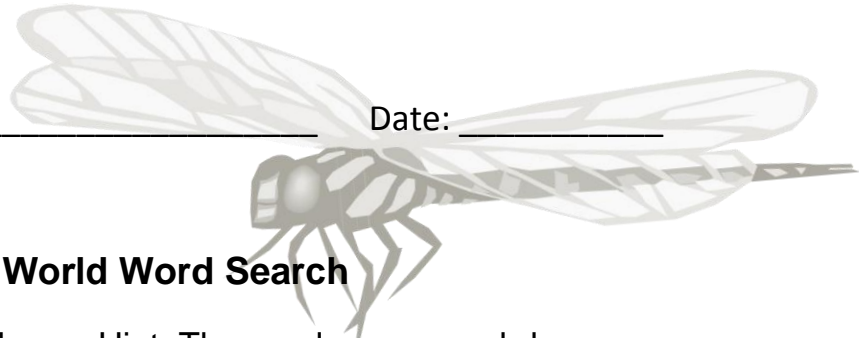


Appendix III:

Extra Classroom Activities



Name: _____ Date: _____



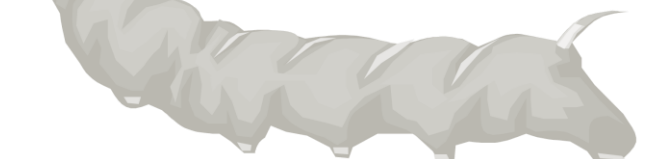
It's a Bug's World Word Search

Directions: Search for the words below. Hint: The words go up-and-down, side-to-side, and diagonal, but not backwards.

Word bank

Abdomen	Adaptation	Arachnid	Arthropod
Camouflage	Cephalothorax	Colony	Decomposer
Habitat	Insect	Invertebrate	Metamorphosis
Poison	Pollination	Solitary	Terrestrial
Thorax	Venom	Vertebrate	

J	C	A	R	A	C	H	N	I	D	V	P	M	O	F	Y	X
D	A	Y	I	Z	I	S	F	J	H	N	O	B	N	S	N	X
X	M	X	N	W	N	J	E	F	Z	G	I	D	H	O	O	M
C	O	J	V	V	E	G	Y	O	M	T	S	R	A	L	Y	E
M	U	I	E	E	C	H	A	I	R	E	O	D	R	I	T	T
D	F	N	R	N	Z	F	D	V	P	R	N	J	T	T	H	A
E	L	S	T	O	M	G	A	E	O	R	P	P	H	A	O	M
C	A	E	E	M	H	K	P	R	L	E	H	K	R	R	R	O
O	G	C	B	B	A	F	T	T	L	S	U	P	O	Y	A	R
M	E	T	R	H	B	Y	A	E	I	T	W	Z	P	S	X	P
P	Q	B	A	Z	I	F	T	B	N	R	M	F	O	J	Y	H
O	G	I	T	M	T	H	I	R	A	I	H	U	D	N	V	O
S	G	C	E	V	A	R	O	A	T	A	C	H	O	S	A	S
E	X	O	L	E	T	O	N	T	I	L	A	L	F	R	B	I
R	L	O	Q	K	P	I	X	E	O	K	O	U	U	L	A	S
Q	I	A	B	D	O	M	E	N	N	C	V	D	H	C	G	G
P	V	D	C	E	P	H	A	L	O	T	H	O	R	A	X	U





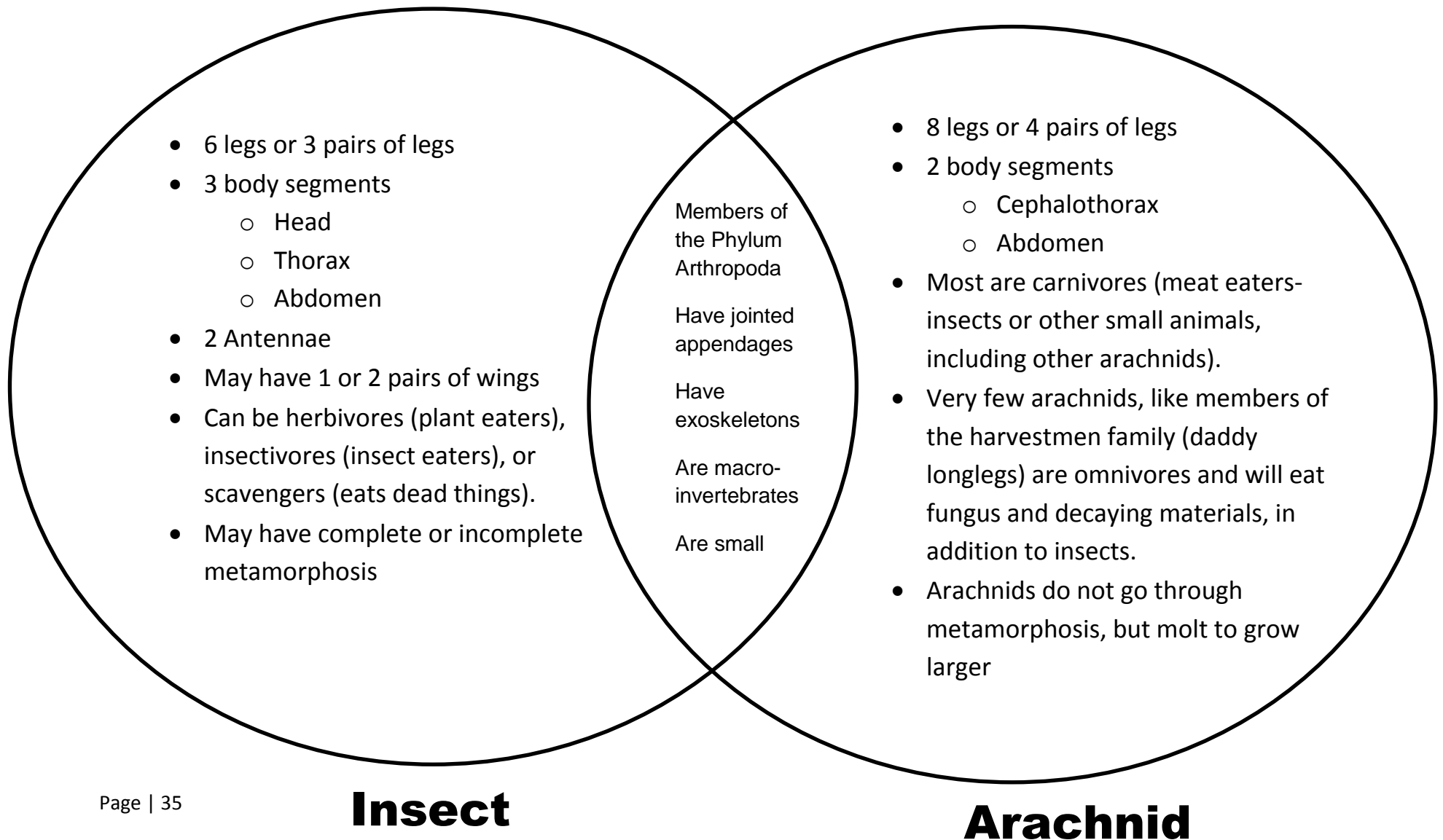
It's a Bug's World Word Search

Answer Key

J	C	A	R	A	C	H	N	I	D	V	P	M	O	F	Y	X
D	A	Y	I	Z	I	S	F	J	H	N	O	B	N	S	N	X
X	M	X	N	W	N	J	E	F	Z	G	I	D	H	O	O	M
C	O	J	V	V	E	G	Y	O	M	T	S	R	A	L	Y	E
M	U	I	E	E	C	H	A	I	R	E	O	D	R	I	T	T
D	F	N	R	N	Z	F	D	V	P	R	N	J	T	T	H	A
E	L	S	T	O	M	G	A	E	O	R	P	P	H	A	O	M
C	A	E	E	M	H	K	P	R	L	E	H	K	R	R	R	O
O	G	C	B	B	A	F	T	T	L	S	U	P	O	Y	A	R
M	E	T	R	H	B	Y	A	E	I	T	W	Z	P	S	X	P
P	Q	B	A	Z	I	F	T	B	N	R	M	F	O	J	Y	H
O	G	I	T	M	T	H	I	R	A	I	H	U	D	N	V	O
S	G	C	E	V	A	R	O	A	T	A	C	H	O	S	A	S
E	X	O	L	E	T	O	N	T	I	L	A	L	F	R	B	I
R	L	O	Q	K	P	I	X	E	O	K	O	U	U	L	A	S
Q	I	A	B	D	O	M	E	N	N	C	V	D	H	C	G	G
P	V	D	C	E	P	H	A	L	O	T	H	O	R	A	X	U

Insect and Arachnid Venn Diagram Key

Answer key

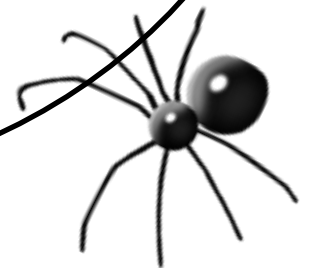
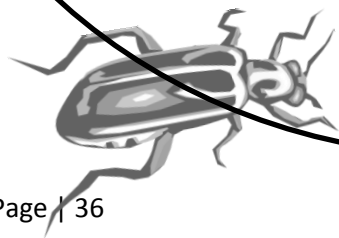
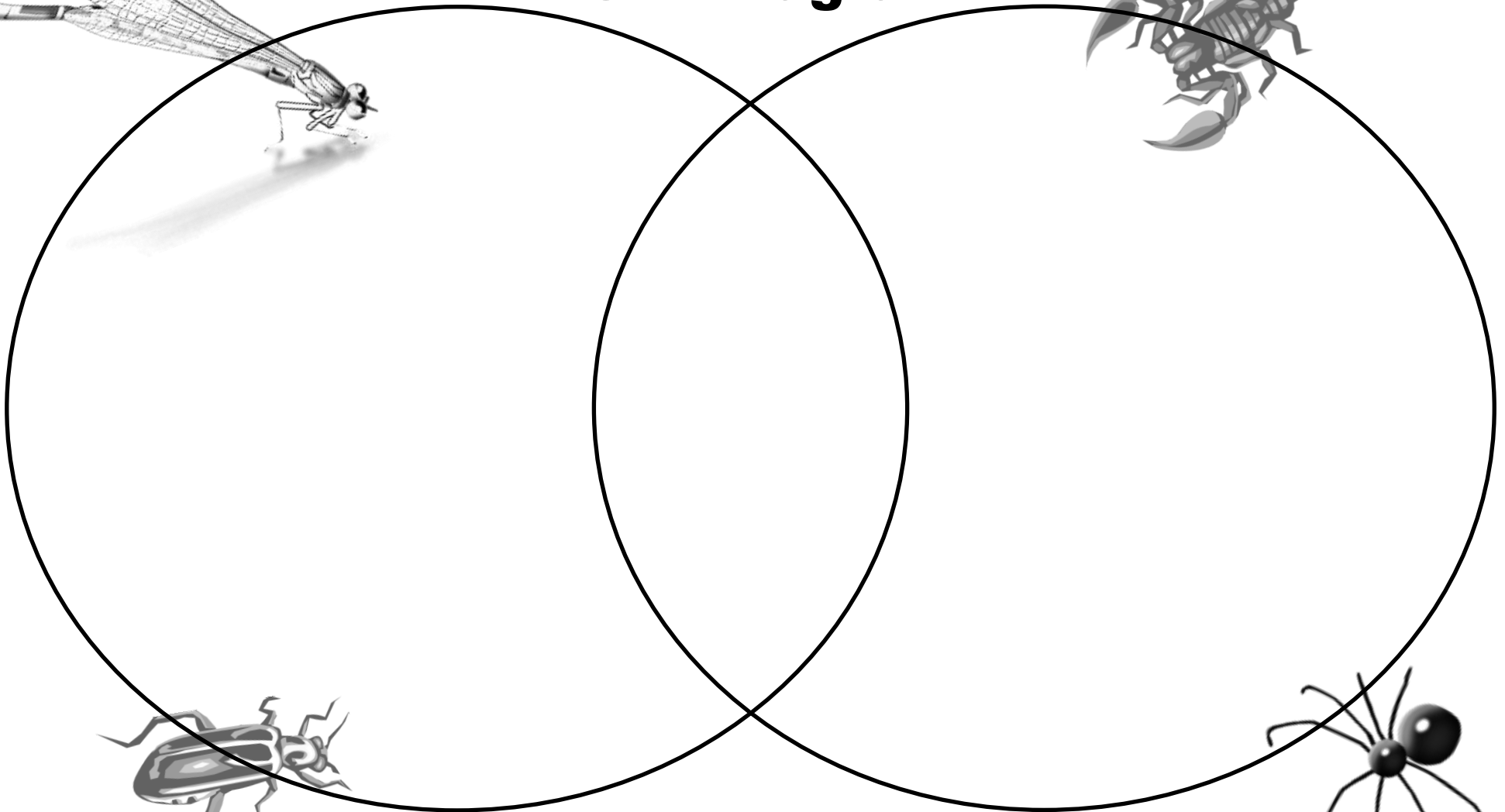
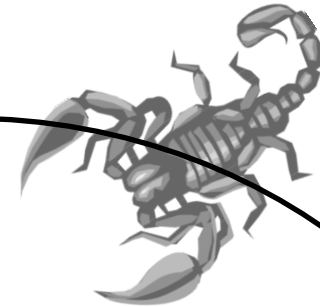
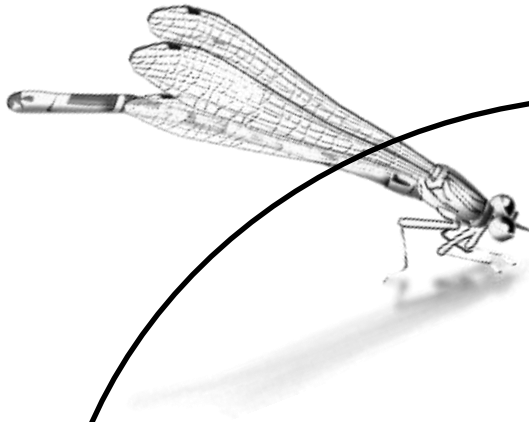


Name: _____

Date: _____

Insect and Arachnid

Venn Diagram



Insect

Arachnid